Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

In the linguistic field we find a like phenomenon. It is natural that the majority of people use slang phrases; and to this it is prudish to object. What is abnormal is that the *littérateurs* and linguists do so, and put those phrases into the dictionaries. The theory of language becomes quite equalitarian: whatever the people use is good, taste being replaced by popularity, good use by use. The experts do not wish, and perhaps they do not dare, to set themselves up as better than the crowd. That current slang has little merit is shown by the brevity of its life; it seldom outlasts two or three years. Instead of elevating the people's standards, this cult of equality lowers the standards of the educated. Is this a condition of progress in English? We may be, indeed, developing a *new* language, but it is so unstable, so subject to popular mood, that it can hardly solidify into an identifiable tongue, or even dialect.

The potent microbe that infests the doctrine of democracy, whether that democracy be conceived as equality or as the social organism, is fear of society. When all is said and done, men fear nothing so much to-day as being considered solitary, or unsocial, or eccentric. Let every man search his own heart and verify this statement. Man's old weakness was physical fear, now universally despised. Perhaps the day will come when social cowardice will be equally detested. At present, excusing itself too often by the one-sided doctrine that man is wholly a social being, it has suppressed the natural growth of the instincts in man which make for independence, and whose development alone can produce individuals who are but to lead the way forward.

The defect of democracy, *viz.*, over-socialization and social cowardice, can be overcome only by a gradual spiritual education which will restore our vanishing respect for the more valuable elements of society, independent leaders.

W. H. SHELDON.

COLLEGE OF THE CITY OF NEW YORK.

ON THE EXTENSION OF THE COMMON LOGIC

CERTAIN remarks on the generalization of the common logic and on the construction of other systems of inference, which the writer addressed to the members of the Philosophical Association at the meeting of December, 1917, have called forth a good deal of unpublished criticism.[1]

---

[1] See the articles, *Aristotle's Other Logic* (*American Journal of Psychology*, Oct., 1918, pp. 431–434), *Non-Aristotelian Logic* (this JOURNAL, Aug. 15, 1918), and *On the Construction of a Non-Aristotelian Logic* (*Monist*, July, 1918).

The devotees of the older logic count our generalization absurd, because, to them, its results appear meaningless, albeit they are meaningful enough to the logician of the newer schools. They would impose upon the terms which enter into the Aristotelian syllogism the condition that these terms should remain distinct; and their motive is clear enough. They can not (nor can any one), on the old understanding of inference give a meaning to an implication such as[2]

$$E(aa) \text{ and } A(ba), \text{ implies } E(ba),$$

the form which "Celarent" takes on when the subject and predicate of the major premise have been identified.

In order to set aside the restriction that the terms of the syllogism shall remain distinct, the logician must resort to a device familiar enough in the history of science. Just as the mathematician, when he meets for the first time equations of a certain type (those, namely, in which the discriminant is less than zero) must extend the meaning of quantity so as to include the case of imaginary quantity, so the logician in the present circumstance must extend the meaning of implication to include cases like the one in question.

In the example above he may postulate the major premise to be an absurdity and may assert, that, if an impossibility be true, then any conclusion will follow and that consequently the mood of the syllogism remains valid—or (in more technical language), if one of the premises becomes *null*, the antecedent vanishes as a whole and the consequent is implied.

The motive which calls for the removal of those limitations which the older logician placed upon the meaning of his symbols, is nothing more than the demand that our terms shall be able to take on all specific meanings, while the propositions into which they enter shall remain true, and that this truth shall be retained by extending the meaning of our symbols of relationship.

"If Cæsar be Socrates, then the moon is made of green cheese," or again, "If the moon be made of green cheese, then the angle-sum of the triangle equals two right angles," are applications of this extended meaning which common sense accepts more readily than the cumbersome mechanism of the ancient scheme of inference. But the motive that prompts us to generalize restricted notions, is a practical one as well. Without the concept of the null-proposition, those dialectic traps of the Cretan liar and the court case of Protagoras and his pupil Euathlus might have passed forever unexposed.[3] In point of fact, the paradoxes of the Greek sophists, which were such a potent spur to the Stagirite's great systematic effort, are many of them beyond the power of his Organon to solve; and for this very reason, that his system is surrounded by historical accidents that only in recent years have come to be removed.

---

[2] In what follows we shall represent the four traditional categorical forms by $A(ab)$, $E(ab)$, $I(ab)$ and $O(ab)$, the small letter written first in the bracket standing for subject, the one written second standing for predicate.

Let us now illustrate the advantage to general theory of giving a meaning to the propositions $A(aa)$ and $I(aa)$—the ones that result on the identification of subject and predicate in the affirmative forms. Suppose that it were required to deduce all of the two hundred and thirty-two invalid moods of the syllogism from the fewest possible number of initial assumptions. In what follows we shall assume that a valid implication must remain true, when as many terms have been identified as we desire. Accordingly, the invalidity of any mood is established, whenever we can point to a special instance of its being untrue. The ordinary forms of immediate inference, which are invalid, will be taken for granted and the propositions, $A(aa)$ and $I(aa)$, will be suppressed, whenever they appear in place of a premise, as adding nothing to the antecedent (or, in more technical language, they will be suppressed as if they were unit multipliers in ordinary algebra). The examples which are set down below will be enough to suggest a general method of reduction, which will yield the moods that are not resolved by the postulates given later on.

I. Suppose that *IOO* (third and fourth figure) were valid. Identifying terms in the major premise and suppressing the part $I(aa)$, the mood of the syllogism reduces to an invalid mood of immediate inference, *viz.*, $O(ac)$ *implies* $O(ca)$. Consequently, these two moods of the syllogism are invalid.

II. By the method of the last example *AAA* (second and third figure) will reduce to $A(ac)$ *implies* $A(ca)$. The moods, *AOO* (first figure and *OAO* (first figure) are of an exceptional character, for they can not be reduced by the method in question. But *AAA* (second figure) yields the first on interchanging contradictories of minor and conclusion and *AAA* (third figure) yields the second on interchanging contradictories of major and conclusion (see under postulate (2) below).

III. Suppose *EAI* (first figure) were a valid mood and identify terms in the minor premise. The result is an invalid mood of immediate inference. Accordingly, *EAI* (first figure) is an invalid mood of the syllogism. Now *EAI* (first figure) yields *EEO* (second figure) on interchanging contradictories of minor and conclusion (see under postulate (2) below).

---

[3] For a modern and rigorous solution of the *insolubilia* as well as for an account of their history see *The Paradoxes of Mr. Russell* by Dr. Edwin R. Guthrie, Jr.

This last result, whose invalidity in the other figures follows at once by simple conversion in the premises, will yield invalid moods of the syllogism that can not be otherwise resolved. We obtain at once from *EEO*, by weakening[4] the premises and strengthening the conclusion, and assuming that the invalidity of the mood is invariant under this operation, each one of the following moods in each one of the four figures, *viz.*,

EEE, *EOE*, *OEE*, *OOE*,
EEO, *EOO*, *OEO*, *OOO*.

In order to resolve the moods that remain let us assume, in the first place

1. *E*(*ba*) *and E*(*cb*) *implies I*(*ca*) *is an invalid mood,* and let us begin by simply converting in the premises in every possible way. The invalidity of *EEI* will then be established in the other three figures, if we assume that the invalidity of a mood is invariant under this operation. If, now, the premises be weakened and the conclusion be strengthened in every possible way and if we assume that the invalidity of the mood is invariant under these operations too, then the untruth of

EEI, *EOI*, *OEI*, *OOI*,
EEA, *EOA*, *OEA*, *OOA*,

will have been established in each one of the four figures. The invalidity of these moods has, accordingly, been made to depend on that of *EEI* (in the first figure) alone.

Let us now assume

2. *A*(*ab*) *and A*(*cb*) *implies I*(*ca*) *in an invalid mood,* and let us suppose that the invalidity of a mood is invariant under the operation of interchanging contradictories of either premise and the conclusion. We obtain at once the theorems:

(*a*) *A*(*cb*) *and E*(*ca*) *implies O*(*ab*) *is an invalid mood, or AEO* (third figure),

(*b*) *AEO* (first figure) from (*a*) by simple conversion in the minor,

(*c*) *AEE* (first and third figures) from (*a*) and (*b*) by strengthening the conclusion,

---

[4] *E*(*ab*) and *A*(*ab*) are said to be strengthened forms of *O*(*ab*) and *I*(*ab*) respectively and *O*(*ab*) and *I*(*ab*) are said to be weakened forms of *E*(*ab*) and *A*(*ab*) respectively.

(*d*) *AII* (second and fourth figures) from (*c*) by interchanging contradictories and converting the minor,

(*e*) *IAI* (third and fourth figures) from (*c*) by interchanging contradictories and converting the major,

(*f*) *EAE* (third and fourth figures) from (*c*) by simple conversion in the conclusion.

The other moods which follow from 2, and whose invalidity is easily established in all four figures, are

EIE, *IEE*, *IEO*, *III*.

The truth of a general proposition has a double justification, (1) *non-empirical*—for all special meanings of the terms, that enter into it, it remains true in the system, of which it is an element; (2) *empirical*—experience furnishes no specific instance of its being untrue.

Similarly, the untruth of a general proposition may have a double justification, (1) *non-empirical*—for some special meaning of the terms, that enter into it, it becomes untrue in the system, of which it is an element; (2) *empirical*—experience furnishes at least one specific instance of its being untrue.

Now it is rightly considered a mark of elegance of technique, that the untruth of a proposition should not be postulated on "empirical" grounds, but should rather be determined as a matter of definition. The postulates, which have been set down above and which can not be resolved by the method of reduction previously explained, are, accordingly, "empirical" and the theorems that follow from them may be said to have an "empirical" foundation. The same remark applies to those moods, which, subject to the method in question, yet can not be finally reduced to a proposition definitionally untrue. Such cases represent, therefore, a certain defect of the system, a defect however, that may well be unavoidable.

In certain formulations of implication, which the writer has called "imaginary" because some of the underlying axioms stand in contradiction to the corresponding axioms of the common logic, an untrue proposition that is "empirical" in the one system may be "non-empirical" in another. These terms are, accordingly, relative to the scheme of inference, to which they apply, their denotation, established by definition, varying within the limits which definition allows. The ideal of reducing the extent of the "empirical" foundation upon which any system rests is frequently realized at the cost of diminishing the number of true elements within the system.

HENRY BRADFORD SMITH.

UNIVERSITY OF PENNSYLVANIA.